

**^Solid Waste EIS - DOE**

**From:** Jeremiah [farseer2002@yahoo.com]  
**Sent:** Tuesday, June 10, 2003 5:08 PM  
**To:** HSWEIS@rl.gov  
**Subject:** Comments on the Hanford Solid Waste EIS

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Comments on the Hanford Solid Waste EIS:

**1** | The EIS as written is unusable for decision making.

The EIS risk analysis is based on the "Systems Assessment Capability" (SAC). This tool has never been tested, verified or validated and forms an inadequate and unproven basis upon which to build a risk assessment.

Contrary to the statements in the EIS, the SAC has no capability to assess uncertainty. It does possess a very limited capability to assess some potential estimation of the imprecision of the central tendency of the model.

To assess uncertainty, the analysis needs to estimate the likely potential range of errors. SAC does not do this.

SAC is based on a very crude and overly simplified one dimensional conceptual model of the vadose zone. This one dimensional purely vertical representation presumes that water flows downward uniformly through the entire volume of the soil. This is known to be false. Water and moisture flow in the subsurface at Hanford is known to follow preferential pathways.

These pathways are known to include

Horizontal movement on the interfacial boundaries between soil layers. Hanford's geology is dominated by the catastrophic ice age floods. These occurred roughly every 55 years over a period of about 1,500 years. Each flood laid down sediments that graded from coarse to fine during the deposition. As the floods receded, the area returned to desert conditions with plant growth and desert pedologic processes. These no doubt involved periodic fires resulting in hydrophobic surface formation. The resulting landforms were not uniformly flat. They included the undulations expected in any such deposition. The resulting surfaces are resistant to the vertical movement of water. Instead, they tend to drive water movement laterally and lead to sheet and channel flow.

**2** | Vertical movement on clastic dikes. As the Hanford study and atlas on clastic dikes shows, these floods also resulted in the formation of massive subsurface vertical clastic dikes and horizontal sills. These dikes are composed of dozens of layers of fine clay materials that both wick moisture and prevent the lateral movement of water, moisture and waste.

Combined, these features describe a radically different subsurface conceptual model from that used in SAC. They describe a subsurface dominated by horizontal transport in thin layers on surface boundaries to vertical walls formed by the clastic dikes. These result in the rapid transport of water and waste from the near surface to the groundwater, bypassing the bulk of the soil volume.

This has been repeatedly documented in Hanford historical documents. It was noted in the 1950's in the 200 West area disposals west of Redox. In those disposals, the records even show that cesium and strontium at depth behaved differently depending on the type of waste they had been disposed in. These reports show deep migration of cesium, strontium, technetium, uranium and other radionuclides into the groundwater.

- 2 It has been documented in the 1960s and 1970s with tank leaks and gamma logs. Three Rivers Environmental analyzed these logs and clearly demonstrated the lateral movement of tank waste. It is seen in the observation of the highest technetium levels ever found at Hanford in the groundwater near the SX tank farm as tank waste has moved across these surfaces, down a vertical surface (probably a dike) to the groundwater. SAC does not predict Technetium in the groundwater.
- It is seen in the high uranium levels in groundwater in the 200 east area. SAC predicts no uranium in groundwater in the next 10,000 years in 200 east. Uranium is already in groundwater in 200 east.
- The horizontal movement of water in the subsurface is clearly shown in the vadose zone observatory data (south of PUREX).
- And, contrary to the belief of some of the technical staff, this horizontal movement is not spreading or lense formation (which might be viewed as retarding waste). It is instead preferential horizontal transport to vertical channels that bypass the soil column and short circuit to the groundwater.
- The EIS should in no way be based on such a clearly flawed and inadequate model.
- Should DOE proceed despite this evidence, it is incumbent on DOE to do large scale field tests of water and waste movement in the central plateau area to determine which conceptual model is correct. When DOE confirms that SAC is incorrect, it is incumbent on DOE to abandon any decision based upon it.

### **More over, at the last meeting of the**

- 3 Groundwater/Vadose Zone Expert Panel, DOE's contractor presented a graphical representation of the health risk that a person would be exposed to if they were to drink two liters of water a day of water from various places on site over the next thousand years. That analysis contained a large though not dominant error. The analysis showed immense radiologic risks exceeding 400 millirem per year over much of the site.
- The EIS does not reveal this earlier analysis or discuss the changes made to the model that reduce this risk by a factor of approximately 1,000 fold. This first analysis was based on DOE and DOE's contractors best evaluation of the data. Once the data was used and the analysis was completed, DOE changed the parameters used in the model. This is an invalid approach to modeling and provides no confidence that the model has anything whatsoever to do with reality.
- It is deceptive to not clearly describe the risks portrayed and to include them as a part of the uncertainty analysis.
- 4 The SAC model includes a vast number of undocumented and untested assumptions. Each of these may drastically alter the results of the model.
- The SAC model excludes the lessons learned from the detailed U-Code analysis of the groundwater model.
- The risk analysis that forms the heart to the EIS is heart is invalid and unreliable. The EIS should be withdrawn.

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**^Solid Waste EIS - DOE**

**From:** BK [kellyforestry@eoni.com]  
**Sent:** Wednesday, June 11, 2003 10:10 AM  
**To:** hsweis@rl.gov  
**Subject:** HSW EIS

To whom it may concern:

This is an email comment regarding the Revised Draft Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS).

- 1** | I am adamantly opposed to bringing more radioactive and hazardous waste into the Hanford Site. The current condition of the Hanford Site is unacceptable, and the proposed activities will add to the problem. Our attention should be focused on the clean-up of the existing environmental problems on site. Resources should be allocated for clean-up, not bringing in additional waste.
- 2** | I am very concerned about the contamination of the Columbia River and the transport of waste on our highways. The activities proposed in the HSW EIS will make an unacceptable situation worse.

Sincerely,  
Brian Kelly  
1809 First Street  
La Grande, OR 97850